

*NIH Human Biomolecular Atlas Program (HuBMAP) Summer Student*

---

**Title:** Spatial Distribution of Mast Cells in Asthma and Non-Asthma Donors

**Background:** Mast cells are intrinsically linked to the pathogenesis of asthma, a chronic inflammatory condition that affects the lower airways of the lung<sup>1</sup>.

- Asthma is characterized by contraction of airway smooth muscle in lower airways of the lung and increased mucus secretion, resulting in difficulty breathing<sup>2</sup>.
- Mast cells are tissue-inhabiting leukocytes that originate from bone marrow. They are one of many cell types that accumulate in the airways of asthma patients<sup>2</sup>.

Any differences observed in spatial distribution between asthma vs. non-asthma donors will support previous observations that mast cells play a role in the asthmatic response

**Objectives:** Identify differences in spatial distribution and enumeration of mast cells between asthma and non-asthma donors, as well as between airways and vessels in the lung.

**Methods:** Identified three asthma donors and three non-asthma donors using BRINDL. Using a microtome, cut desired lung samples from formalin fixed paraffin embedded (FFPE) blocks. Stained slides of FFPE lung tissue with both Akoya™ and self-conjugated antibodies. Ran 45-marker panel on each slide using the Akoya™ Phenocycler and Phenoimager, resulting in

um test. Compared statistical  
non-asthma donors and airways vs.

ound airways than vessels.  
rways of asthma donors, they are  
previous research that the spatial  
onse.

<sup>1</sup>Méndez-Enríquez, E., & Hallgren, J. (2019, March 28). Mast cells and their progenitors in allergic asthma. <https://www.frontiersin.org/journals/immunology/articles/10.3389/fimmu.2019.00821/full>

<sup>2</sup>Banafea, G. H., Bakhashab, S., Alshaibi, H. F., Natesan Pushparaj, P., & Rasool, M. (2022). The role of human mast cells in allergy and asthma. *Journal of Inflammation*, *2022*(3), 7049–7064. <https://doi.org/10.1080/21655979.2022.2044278>